16 January 2001

CRUISE RESULTS

NOAA FRV ALBATROSS IV
Cruise No. AL 00-06 (Parts I-IV)
Autumn Bottom Trawl Survey

CRUISE PERIOD AND AREA

The cruise period was from 5 September to 21 October. The cruise was conducted in four parts: Part I was during 5-16 September; Part II, 18-29 September; Part III, 3-13 October; Part IV, 16-21 October. The area of operation was from Cape Hatteras to the western Scotian Shelf including the Gulf of Maine. Station locations are shown in Figures 1 and 2.

OBJECTIVES

The objectives of the cruise were to:(1)determine the seasonal distribution and relative abundance of fish and invertebrate species found on the continental shelf;(2)collect biological samples for studies of age and growth relationships, fecundity, maturity, and food habits; (3)collect hydrographic and meteorological data; (4)collect samples of ichthyoplankton and zooplankton; (5)take data and sample collections for cooperative researchers and programs; (6)test a networked data entry at sea software and hardware system; and (7)conduct a gear comparison with the Delaware II during Part IV of the survey.

METHODS

Operations and gear conformed with the Cruise Instructions for the autumn bottom trawl survey dated 1 August 2000 with the following exceptions: Part III departed one day later on 3 October due to vessel mechanical problems. Also, during this part of the survey, a short port call was made to Portland, Maine due to weather conditions. Part IV returned 6 days earlier than scheduled. Mechanical problems on the Delaware II canceled the gear comparison work between the two vessels.

A 30-minute tow was made at pre-selected stations with the Northeast Fisheries Science Center (NEFSC) standardized number 36 Yankee otter trawl that was rigged with 41 centimeter (cm) diameter rollers, 9 meter (m) bridles and 450 kilogram (kg) polyvalent trawl doors rigged with chain backstraps. The trawl was fished at a scope of 4:1 in water depths between 18 and 27 m;

3:1 in depths between 27 and 184 m; and 2.5:1 in depths greater than 184 m. During the survey, speed was primarily determined using DGPS instrumentation. Direction of tow was generally toward the next station.

For each species, total weight was obtained using motion compensated electronic scales and recorded to the nearest 0.1 kilogram (kg) on standard trawl logs. On a separate data sheet, sampled fish were assigned individual identification numbers, measured, weighed and further sampled for age and growth and food habits studies. Bony fish were measured to the nearest centimeter (cm) to the end of the central caudal ray; biological samples were collected concurrently with measuring operations. Sharks and skates were measured to the end of the caudal fin (total length). Disk width was measured for rays. Lobsters were measured in millimeters (mm) from the posterior edge of the eye socket to the end of the carapace; the presence or absence of a V-notch was also noted . Crabs were measured across the carapace width(cm). Shell height was measured in (cm) for selected bivalves. Additional collections were obtained for various scientists. The remainder of the catch (miscellaneous invertebrates, shells, substrate, et cetera) was described by volume.

A digital Fisheries Scientific Computer System (FSCS), “digital data acquisition system” which will be used to collect Resource Surveys fishery data in the future, was tested on leg III. This system uses digital measuring boards, touch screen displays and bar code scanners. Earlier FSCS testing during the Winter 2000 Bottom Trawl Survey focused on hardware durability and single station data acquisition. Software development was fully tested on three networked computers with data simultaneously recorded on traditional paper logs and electronically for 48 stations. Digital data review and further enhancements will be made based on suggested changes.

Surface temperatures were measured using the hull-mounted temperature sensor at a depth of three meters. Temperature and conductivity profiles were made using a conductivity, temperature, depth (CTD) system. A bottom salinity sample was obtained twice each day to calibrate the CTD. Water samples were also taken for fluorometer calibrations.

Samples of fish eggs and larvae were collected at selected stations. Plankton sampling gear consisted of a 61 cm bongo frame fitted with 0.333 mm mesh nets. Digital flowmeters were suspended within the mouths of the bongo frame. The net was towed at 2.8-3.7 kilometers/hour (1.5-2.0 knots). A CTD was deployed at each plankton station. Throughout the cruise, eastern daylight time was maintained.

RESULTS

There were three hundred thirty seven stations occupied during the cruise with 112, 112, 76, and 37 stations completed on parts I-IV, respectively. NEFSC standardized plankton tows were made at 121 stations. Bottom temperatures were collected at 337 stations using the CTD system. Bottom water samples for CTD calibration were taken on 41 stations. All trawl logs and detail sheets, were hand processed at sea. Tables 1 and 2 list the major samples collected for various studies.

DISPOSITION OF SAMPLES AND DATA

Age and growth samples, food habits data and samples, maturity data, trawl catch data, hydrographic data and data from the Fisheries Scientific Computer System will be analyzed at the NEFSC Woods Hole, Massachusetts, Laboratory. The various collections were forwarded to the individuals listed in Table 2. Resulting data will be audited, edited and entered into the NEFSC trawl survey data base in 2001.

SCIENTIFIC PERSONNEL

National Marine Fisheries Service, NEFSC, Woods Hole, MA
John Galbraith, Chief Scientist, Part I*, Participant, Part III
Holly McBride, Chief Scientist, Parts II** & III***
Linda Despres, Chief Scientist, Part IV****
Elisabeth Broughton, III
Jason Link, II
Barbara Lewis, III
Paul Kostovick, III
William Kramer, III
Henry Milliken, IV
Victor Nordahl, I
Elizabeth O'Neill, II
Gary Shepherd, IV
Terrence Smith, IV
Katherine Sosebee, I, IV
Scott Steinback, II
Scott Van Sant, I, IV

National Marine Fisheries Service, NEFSC, Highlands, NJ
John Sibunka, II

National Marine Fisheries Service, NEFSC, Narragansett, RI
Jacquelyn Anderson, I, III
Stephen Brownell, II, IV
Elaine Caldarone, II
Rebecca Jones, III
Joseph Kane, I
Sharon MacLean, IV

Scientific personnel (continued):

National Marine Fisheries Service, NOAA, NODC, Silver Spring, MD
Michael Ford, II

National Marine Fisheries Service, OMAO, MOC, Silver Spring, MD
David Begnini, III
Dennis Shields, III

University of Massachusetts, Amherst, MA
Joseph Kunkel, III
Douglas Sigourney, IV
Andrew Stein, IV

South Carolina Division of Natural Resources, Charleston, SC
Charles Wenner, I

Hampshire College, Amherst, MA
Susan Prattis, I

University of Rhode Island, Narragansett, RI
Timothy Bohan, I

North Carolina Sea Grant, Manteo, NC
Anne Pierce, I

Eastern Nazarene College, Quincy, MA
Holly Frank, II

Island Institute, Rockland, ME
Benjamin Neal, IV

Lowestoft Laboratory, Lowestoft, England
Phillip Davison, III

Contractors, PTSI, Woods Hole, MA
Lawrence Brady, IV
Daniel Harrison, III
Jesse Lamb, III
Sandra Sutherland, IV
Mirta Teichberg, III
Katherine Tadema-Weilandt, III

Contractor, PTSI, New Bedford, MA
Anna Marcalo, II

Teacher-at Sea Program, St. Louis, MO
Sandy Smiljanich, II

Scientific personnel (continued):

Volunteers

Walter Carr, I	Pleasant Hill, CA
Judy Holland, II	West Tisbury, MA
Dianna Mathias, I	Martinez, CA
Arthur Reyes, II	Burlingame, CA

* Part I, 5-16 September
** Part II, 18-29 September
*** Part III, 3-13 October
**** Part IV, 16-21 October

****

For further information contact Thomas Azarovitz, National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, Massachusetts 02543-1097. Telephone (508) 495-2283; FAX (508) 495-2258; INTERNET *Tom.Azarovitz@noaa.gov*.

****

Table 1. Field observations and samples collected for feeding ecology, and age and growth studies on FRV ALBATROSS IV, Cruise 00-06, Autumn Bottom Trawl Survey, during 5 September - 21 October 2000.

Species	Feeding Ecology Observations	Age and Growth Samples
Acadian redfish	112	514
Alewife	10	-
American plaice	183	537
American shad	10	-
Atlantic cod	195	314
Atlantic croaker	19	98
Atlantic halibut	8	9
Atlantic herring	143	191
Atlantic mackerel	41	13
Atlantic wolffish	1	-
Barndoor skate	21	-
Black sea bass	67	195
Blackbelly rosefish	18	-
Blueback herring	20	-
Bluefish	89	212
Butterfish	222	647
Clearnose skate	16	-
Cobia	1	-
Cunner	5	-
Cusk	3	5
Fawn cusk-eel	18	-
Fourspot flounder	112	278
Goosefish	159	85
Haddock	198	578
Little skate	208	-
Longhorn sculpin	132	-
Lookdown	2	-
Ocean pout	65	71
Offshore hake	7	11
Pollock	72	134
Red drum	-	1
Red hake	206	881
Rosette skate	6	-
Scup	141	381
Sea raven	32	-
Silver hake	61	1,521
Smooth dogfish	109	-
Smooth skate	32	-
Spanish mackerel	1	-
Spiny dogfish	417	-
Spotted hake	169	244
Striped bass	12	-

Table 1 (continued)

Species	Feeding Ecology Observations	Age and Growth Samples
Summer flounder	272	468
Tautog	1	-
Thorny skate	42	-
Urophysis sp.	-	34 YOY
Weakfish	149	84
White hake	198	421
Windowpane	87	234
Winter flounder	199	640
Winter skate	156	-
Witch flounder	-	238
Yellowtail flounder	106	348
TOTALS	4,553	9,387

Table 2. Miscellaneous scientific collections made on FRV ALBATROSS IV, Cruise 00-06, Autumn Bottom Trawl Survey, during 5 September - 21 October 2000.

Investigator & Affiliation	Samples Saved	Approximate Number
Frank Almeida, NMFS, NEFSC, Woods Hole, MA	Male spiny dog	4 indiv.
Aquarium, NMFS, NEFSC Woods Hole, MA	Loligo	36 bags
	Live misc. species	7 indiv.
Larry Buckley, NMFS, NEFSC, Narragansett Lab Narragansett, RI	Young-of-year cod	2 indiv.
	Young-of-year haddock	42 indiv.
Kendra Buresch, MBL Woods Hole, MA	Loligo	87 indiv.
John Burnett, NMFS, NEFSC, Woods Hole, MA	Misc. species for maturity workshop	30 indiv.
	Cunner	169 indiv.
	Yellowtail	17 indiv.

Table 2. (continued)

Investigator & Affiliation	Samples Saved	Approximate Number
Steven Cadrin, NMFS, NEFSC, Woods Hole, MA	Yellowtail	75 indiv.
Elaine Caldarone, NMFS, NEFSC, Narragansett, RI	Haddock	25 indiv.
Clive Fox, Lowestoft Lab. Lowestoft, England	Haddock	24 indiv.
	Cod	31 indiv.
John Galbraith, NMFS, NEFSC, Woods Hole, MA	Misc. species	37 indiv.
Karsten Hartel, Museum of Comparative Zoology Cambridge, MA	Misc. species	18 indiv.
Lisa Hendrickson, NMFS, NEFSC, Woods Hole, MA	Illex squid	604 indiv.
Jay Hermsen, URI, Narragansett, RI	Sea raven	7 indiv.
Josef Idoine, NMFS, NEFSC, Woods Hole, MA	Shrimp	58 samples
Kenneth Kessenich, Univ. School, Milwaukee Milwaukee, WI	Butterfish	20 indiv.
Nancy Kohler, NMFS, NEFSC, Narragansett, RI	Tagged sharks	8 indiv.
Joseph Kunkel, UMASS, Amherst, MA	Misc. species	10 indiv.
	Male/female lobster	96 indiv.
Thomas Munroe, NMFS Nat'l Systematics Lab Washington, DC	Tonguefish	3 indiv.
Anne Richards, NMFS, NEFSC, Woods Hole, MA	Northern shrimp	21 indiv.
	Female goosefish	8 indiv.
Cheryl Ryder, NMFS, NEFSC, Woods Hole, MA	Tagged loggerhead turtle	1 indiv.

Table 2. (continued)

Investigator & Affiliation	Samples Saved	Approximate Number
Daniel Salerno, NMFS, NEFSC, Woods Hole, MA	Misc. species for observer program	72 indiv.
Douglas Sigourney, UMASS Amherst, MA	Atlantic halibut	3 indiv.
Katherine Sosebee, NMFS, NEFSC, Woods Hole, MA	Female spiny dogfish pup lengths/weights	59 indiv.
	Barndoor skate ovaries/vertebrae	8 indiv.
	Various other skates	311 indiv.
Douglas Stoner, South Carolina DNR, Charleston, SC	Barndoor skate fin clip	6 indiv.
Charles Wenner, South Carolina DNR, Charleston, SC	Croaker	61 indiv.
Sara Wetmore, NMFS, NEFSC, Woods Hole, MA	Longfin hake	10 indiv.
	Pearlsides	6 indiv.

Figure 1. Trawl hauls made from the FRV ALBATROSS IV, during National Marine Fisheries Service, Northeast Fisheries Science Center autumn bottom trawl survey, (00-06), 5 September - 21 October, 2000.
Map 1 of 2

Figure 2. Trawl hauls made from the FRV ALBATROSS IV, during National Marine Fisheries Service, Northeast Fisheries Science Center autumn bottom trawl survey, (00-06), 5 September - 21 October, 2000.
Map 2 of 2